International University of Africa

College of Graduate studies

Assessment of kidneys' dose received from some surrounding organs radiographic examinations

A thesis submitted in Partial Fulfillment of the Requirements for the Degree of Master in Medical Physics

By:

TagwaTagEldin Ali Mohammed

Supervisor:

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Associated professor

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قَالَ تَعَالَىٰ:

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صدق الله العظيم

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Dedication

I dedicate mythesis to my family and friends. Especial feeling of gratitude to my loving parents, whose words of encouragement and support for tenacity ring in my ears, words couldn't be found to describe what they have done to me whole my life .

Acknowledgements

I am extraordinarily grateful to the person who guided me throughout the long hard process of the preparation of this thesis; Dr. Nadia Omer Alatta , my supervisor for her countless hours of reflecting ,reading, encouraging , and most of all patience throughout the entire process . I would like to thank my father Tag Eldin Ali and my mother BatulAbulgasim for their imperative help, patience, support, care, hard work and for being there for me .I would like to acknowledge and thank myteachersand colleagues at International university of Africa for providing any assistance requested . Special thanks for the members of Medical Physic Department staff for their continued supports.

Abstract

This study was performed in three hospitals at Khartoum state to assess the values of entrance surface air kerma (ESAK) and kidneys' dose for 60adults patients whom their ages ranged between 20-80 years, underwent chest and abdominal radiographic examination. .The essential aim of this study was to find the value of kidneys' dose and compare the value ofESAK with the reference level for diagnostic. The CALdose software was used to estimate these values by entering the exposure factors Kv and mAs ,the output of the machine and information about the patient like age and gender. Variation was found in values of ESAK and kidneys' dose from one hospital to anotherat the same exam, these variations due to the difference in setting of exposure factors to each patient ,also to the difference in the output of machine.By comparing these values with reference level for diagnostic, it was found that in some hospitals the values are higher than the reference level for diagnostic. Kidneys' dose was smalland ithas no considerable concern.

الملخص

تمت هذه الدراسة في ثلاثة مستشفيات بولاية الخرطوم لتقيم كيرما السطحيه وجرعة الكلي لي 60 مريض اعمارهم مابين 20 الي 80 سنه خضعو لي اشعة تشخيصية علي الصدر والبطن.الهدف الاساسي من الدراسه هوايجاد قيمة جرعة الكلي وكيرما السطحية ومقارنتها مع الحدود المرجعية .تم استخدام برنامج (CALdose) لتقدير هذه القيم بادخال قيم عوامل التعرضkvpmAs. وجد انا هنالك اختلافات في قيم كيرما السطحيه وجرعة الكلي لي نفس الاختبار من مستشفي الي اخر هذه الاختلافات بسبب اختلاف قيم التعرض بإختلاف المرضي وكذلك قيمة جهد الجهاز. بمقارنة هذه القيم مع القيم المرجعية وجد ان هنالك ارتفاع عن القيم المرجعية في بعض المستشفيات وان قيمة جرعة الكلي صغيرة ولا تمثل قلق جدير بالاعتبار.

Abbreviation:

ESAK	Entrence Surface Air Kerma
INAK	Incident Air Kerma
ICPR	International commission on Radiation protection
NRPB	National Radiographic Protection Board
CCs	Conversion coefficients
FDD	Field to Detector Distance
EM	Electromagnetic
AP	Anterior Posterior
PA	Posterior Anterior
LLAT	Left Lateral
FDD	Field to detector distance
DNA	Deoxyribonucleic acid
ESD	Entrance surface dose
ED	Effective dose
KAP	kerma area product
LCD	Digital liquid crystal display

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